



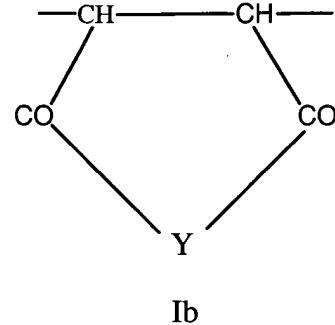
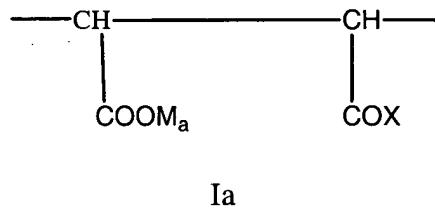
PATENT  
512425-2059

THE CLAIMS:

1-24 (cancelled)

25. (Currently Amended) An aqueous pigment concentrate which comprises  
-- a pigment;  
-- a copolymer based on oxyalkyleneglycol-alkylene ethers oxyalkylenealkylglycol-  
alkylene ethers or polyoxyalkylene oxide alkenyl ethers and unsaturated dicarboxylic acid  
derivative comprising

- a) from about 10 to about 90 mol% of structural groups of the formula Ia  
and/or Ib



where

M = hydrogen, monovalent or divalent metal cation, ammonium ion, or  
an organic amine radical;

a = 1 or, if M is a divalent metal cation, is  $\frac{1}{2}$ ;

X =  $-OM_a$  ;

$-O-(C_mH_{2m}O)_n-(C_mH_{2m}O)_o-R^1;$

$-O-(C_mH_{2m}O)_n-(C_mH_{2m}O)_o-R^1;$

where

$R^1$  = is H, an aliphatic hydrocarbon radical, a cycloaliphatic hydrocarbon radical, or an aryl radical, which is unsubstituted or substituted;

$l$  = 1 or 2,

$m$  = 2 to 18,

the index on the hydrogen atom being formed by the product of  $l$  and  $m$ , i.e.,  $l \cdot m$

$n$  = 0 to 100, and

$o$  = 0 to 100;

$-NHR^2$ ;

$-NR^2_2$ ;

where in the last two radicals  $R^2$  is  $R^1$  or  $-CO-NH_2$ ; or

$-Q^1N - Q^2 - NQ^3Q^4$ ,

where

$Q^1$  is a hydrogen atom or a monovalent hydrocarbon radical,

$Q^2$  is a divalent alkylene radical, and

$Q^3$  and  $Q^4$  are aliphatic and/or alicyclic alkyl radicals,

and are unoxidized or oxidized to  $-Q^1N-Q^2-N^{(+)}O^{(-)}Q^3Q^4$ ,

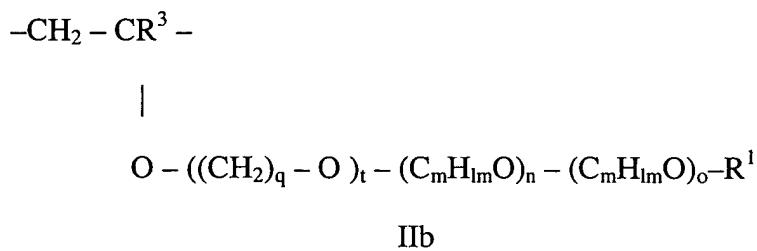
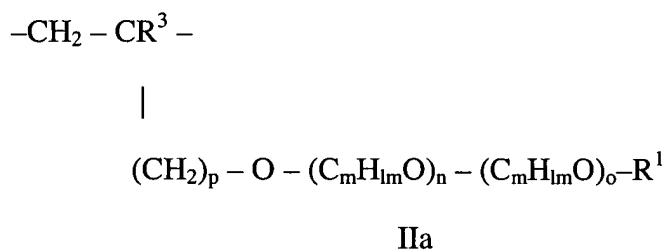
$Y = O, NR^2$ , or  $N-Q^2-NQ^3Q^4$ ,

where

$R^2$  being as defined above, and

$Q^2$ ,  $Q^3$  and  $Q^4$  being as defined above,

- b) from about 1 to about 89 mol% of structural groups of the formula IIa or  
IIb



in which

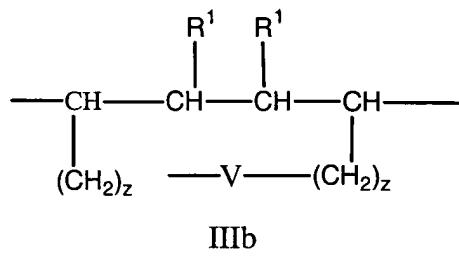
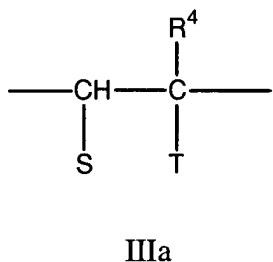
$R^3 = H$  or an aliphatic hydrocarbon radical,

$p = 0$  to 3,

$q = 0$  to 6,

$t = 0$  to 3, and

c) about 0.1 to about 10 mol% structural groups of the formula IIIa or IIIb



where

$\text{R}^4 = \text{H}$  or  $\text{CH}_3$ ;

$S = \text{H}$ ,  $-\text{COOM}_a$ , or  $-\text{COOR}^5$ ;

where

$\text{R}^5 = \text{aliphatic hydrocarbon radical, cycloaliphatic}$

$\text{hydrocarbon radical, or aryl radical;}$

$T = \frac{-\text{COOR}^5, \text{in the case where } 5 \text{ is } -\text{COOR}^5 \text{ or } \text{COOM}_a - \text{U}^1 - \text{O}}{(\text{C}_m\text{H}_{l+m}\text{O}_m)_n - (\text{C}_m\text{H}_{l+m}\text{O})_o - \text{R}^6}$

$\underline{-\text{U}^1 - (\text{C}_m\text{H}_{l+m}\text{O})_n - (\text{C}_m\text{H}_{l+m}\text{O})_o - \text{R}^6}$

where

$l = 1$  or 2,

$m = 2$  to  $18$ ,

$n = 0$  to  $100$ , and

$o = 0$  to  $100$ ;

$U^1 = -CO - NH-, -O-,$  or  $-CH_2O-,$

$R^6 = R^1;$

$-CH_2 - CH - U^2 - C = CH$

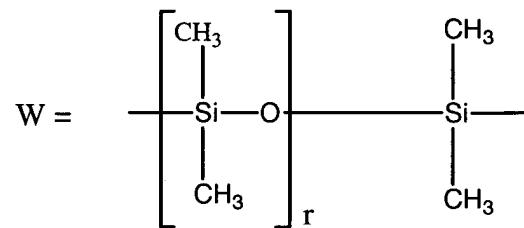
|                  |      |

$R^4$              $R^4$     S

where

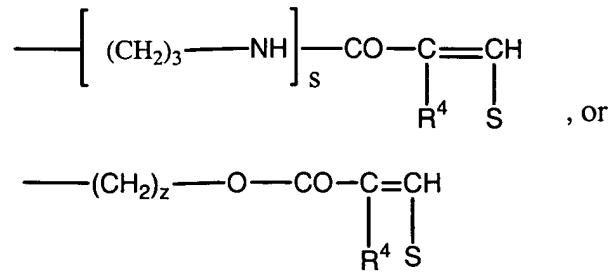
$U^2 = -NH - CO-, -O-, OCH_2,$  or  $-W-R^7,$

where



$r = 2$  to  $100$ , and

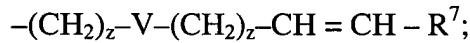
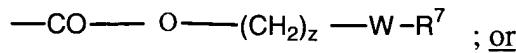
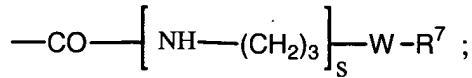
$R^7 = R^1,$



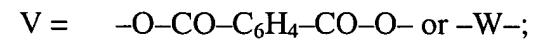
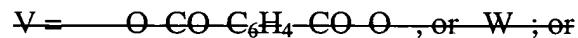
where

$$s = 1 \text{ or } 2$$

$$z = 0 \text{ to } 4;$$



where, in the last three radicals,



~~-COOR<sup>5</sup>, in the case where S is COOR<sup>5</sup> or COOM<sub>a</sub>;~~

-- water;

-- optionally a co-solvent;

and

-- optionally an auxiliary.

26. (Previously presented) The aqueous pigment concentrate according to claim 25, wherein a co-solvent is present and it is a glycol ester or a glycol ether.

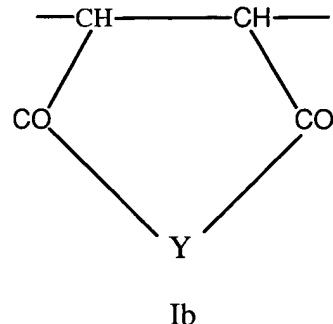
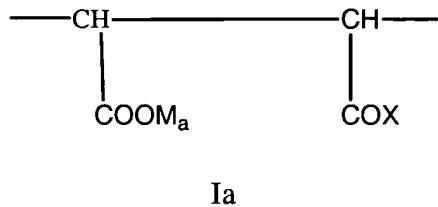
27. (Currently presented) An aqueous pigment concentrate which comprises

-- a pigment;

-- a copolymer based on oxyalkyleneglycol-alkylene ethers oxyalkylenealkylglycol-alkylene ethers or polyoxyalkylene oxide alkenyl ethers and unsaturated dicarboxylic acid derivative comprising

a) from 10 to 90 mol% of structural groups of the formula Ia

and/or Ib



where

M = hydrogen, monovalent or divalent metal cation, ammonium ion, or an organic amine radical;

a = 1 or, if M is a divalent metal cation, is ½;

X = -OM<sub>a</sub>;

-O-(C<sub>m</sub>H<sub>l+m</sub>O)<sub>n</sub>-(C<sub>m</sub>H<sub>l+m</sub>O)<sub>e</sub>-R<sup>t</sup>;

-O-(C<sub>m</sub>H<sub>l+m</sub>O)<sub>n</sub>-(C<sub>m</sub>H<sub>l+m</sub>O)<sub>o</sub>-R<sup>1</sup>;

where

R<sup>1</sup> = is H, an aliphatic hydrocarbon radical, a cycloaliphatic hydrocarbon radical, or an aryl radical, which is unsubstituted or substituted;

l = 1 or 2,

m = 2 to 18,

the index on the hydrogen atom being formed by the product of l and m, i.e., l·m

n = 0 to 100, and

o = 0 to 100;

-NHR<sup>2</sup>;

-NR<sup>2</sup><sub>2</sub>;

where in the last two radicals R<sup>2</sup> is R<sup>1</sup> or -CO-NH<sub>2</sub>; or

-Q<sup>1</sup>N-Q<sup>2</sup>-NQ<sup>3</sup>Q<sup>4</sup>,

where

Q<sup>1</sup> is a hydrogen atom or a monovalent hydrocarbon radical,

$Q^2$  is a divalent alkylene radical, and

$Q^3$  and  $Q^4$  are aliphatic and/or alicyclic alkyl radicals,

and are unoxidized or oxidized to  $-Q^1N-Q^2-N^{(+)}O^{(-)}Q^3Q^4$ ,

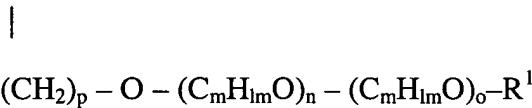
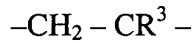
$Y = O, NR^2$ , or  $N-Q^2-NQ^3Q^4$ ,

where

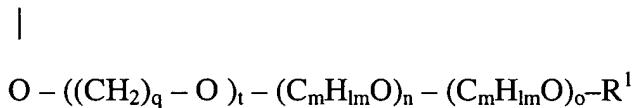
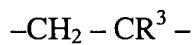
$R^2$  being as defined above, and

$Q^2, Q^3$  and  $Q^4$  being as defined above,

b) from 1 to 89 mol% of structural groups of the formula IIa or IIb



IIa



IIb

in which

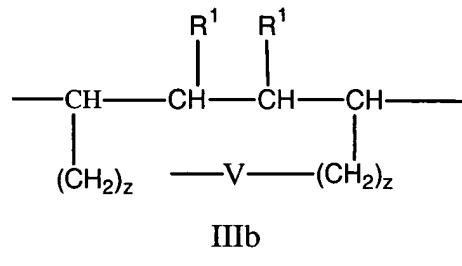
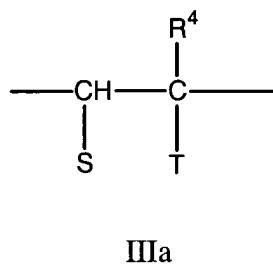
$R^3 = H$  or an aliphatic hydrocarbon radical,

$p = 0$  to 3,

$q = 0$  to 6,

$t = 0$  to 3, and

c) about 0.1 to about 10 mol% structural groups of the formula IIIa or IIIb



where

$R^4 = \text{H or } CH_3;$

$S = \text{H, } -COOM_a \text{, or } -COOR^5;$

where

$R^5 = \text{aliphatic hydrocarbon radical, cycloaliphatic hydrocarbon radical, or aryl radical;}$

$T = \underline{-COOR^5, \text{in the case where } 5 \text{ is } -COOR^5 \text{ or } COOM_a, -U^1-O-(C_mH_{l+m}O_n)-(C_mH_{l+m}O_o)-R^6}$

$\underline{-U^1-(C_mH_{l+m}O_n)-(C_mH_{l+m}O_o)-R^6}$

where

$l = 1$  or  $2$ ,

$m = 2$  to  $18$ ,

$n = 0$  to  $100$ , and

$o = 0$  to  $100$ ;

$U^1 = -CO - NH-, -O-,$  or  $-CH_2O-,$

$R^6 = R^1;$

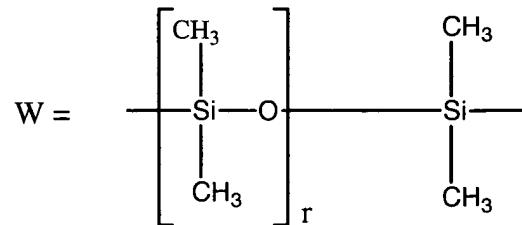
$-CH_2 - CH - U^2 - C = CH$



where

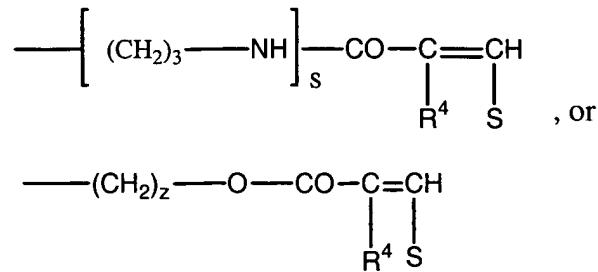
$U^2 = -NH - CO-, -O-, OCH_2,$  or  $-W-R^7,$

where



$r = 2$  to  $100$ , and

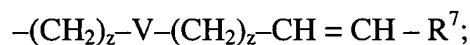
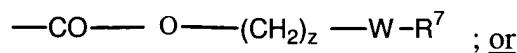
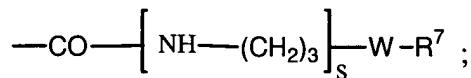
$R^7 = R^1,$



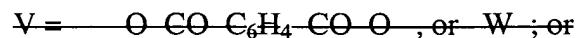
where

$$s = 1 \text{ or } 2$$

$$z = 0 \text{ to } 4;$$



where, ~~in the last three radicals,~~



$\text{--- COOR}^5$ , in the case where S is  $\text{--- COOR}^5$  or  $\text{COOM}_a$ ;

-- water;

-- optionally a co-solvent;

and

-- optionally an auxiliary.

28. (Previously presented) The aqueous pigment concentrate according to claim 25, wherein the pigment is an inorganic pigment.

29. (Previously presented) The aqueous pigment concentrate according to claim 28, wherein the pigment is an iron oxide.

30. (Previously presented) The aqueous pigment concentrate according to claim 28, wherein the pigment is a transparent iron oxide.

31. (Previously presented) A coating system which comprises an aqueous pigment concentrate according to claim 25 and an aqueous coating material.

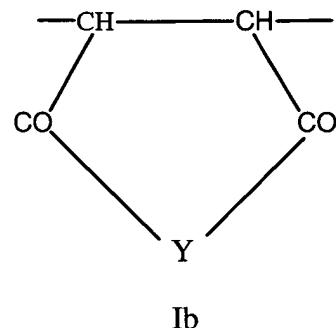
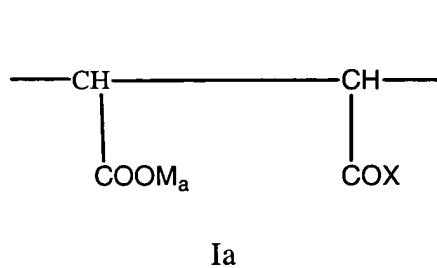
32. (Previously presented) The coating system according to claim 31, wherein the coating material is a one-component coating material which is based on alkyl, acrylate, epoxy, polyvinyl acetate, polyester, or polyurethane resins.

33. (Previously presented) The coating system according to claim 31, wherein the coating material is two-component coating material based on hydroxyl-containing polyacrylate or polyester resins with melamine resins or optionally blocked polyisocyanate resins as cross linkers, or polyepoxide resins.

34. (Currently Amended) An aqueous pigment concentrate comprising  
-- a pigment;

-- a copolymer based on oxyalkyleneglycol-alkylene ethers oxyalkylenealkylglycol-alkylene ethers or polyoxyalkylene oxide alkenyl ethers and unsaturated dicarboxylic acid derivative comprising

- a) from about 10 to about 90 mol% of structural groups of the formula Ia and/or Ib

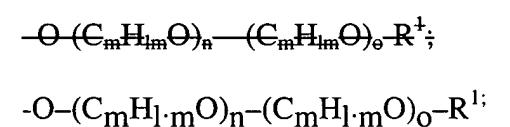


where

M = hydrogen, monovalent or divalent metal cation, ammonium ion, or an organic amine radical;

a = 1 or, if M is a divalent metal cation, is  $\frac{1}{2}$ ;

X =  $-OM_a$  ;



where

$R^1$  = is H, an aliphatic hydrocarbon radical, a cycloaliphatic hydrocarbon radical, or an aryl radical, which is unsubstituted or substituted;

$l$  = ~~1 or 2~~,

$m$  = 2 to 18,

the index on the hydrogen atom being formed by the product of  $l$  and  $m$ , i.e.,  $l \cdot m$

$n$  = 0 to 100, and

$o$  = 0 to 100;

$-NHR^2$ ;

$-NR^2_2$ ;

where in the last two radicals  $R^2$  is  $R^1$  or  $-CO-NH_2$ ; or

$-Q^1N - Q^2 - NQ^3Q^4$ ,

where

$Q^1$  is a hydrogen atom or a monovalent hydrocarbon radical,

$Q^2$  is a divalent alkylene radical, and

$Q^3$  and  $Q^4$  are aliphatic and/or alicyclic alkyl radicals,

and are unoxidized or oxidized to  $-Q^1N-Q^2-N^{(+)}O^{(-)}Q^3Q^4$ ,

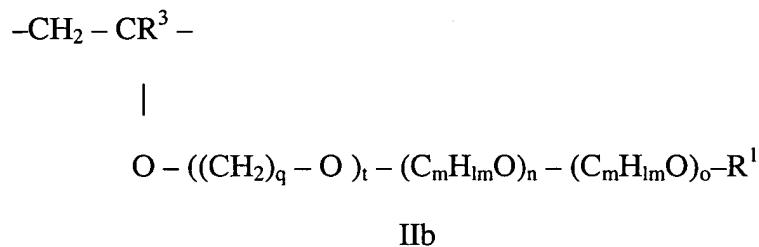
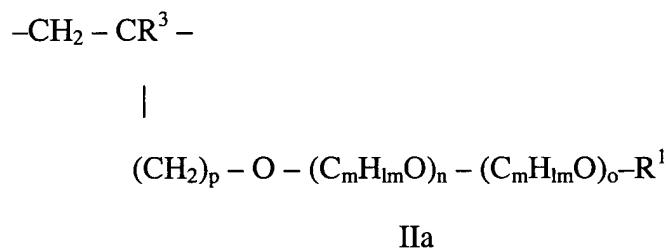
$Y = O, NR^2$ , or  $N-Q^2-NQ^3Q^4$ ,

where

$R^2$  being as defined above, and

$Q^2, Q^3$  and  $Q^4$  being as defined above,

- b) from about 1 to about 89 mol% of structural groups of the formula IIa or IIb



in which

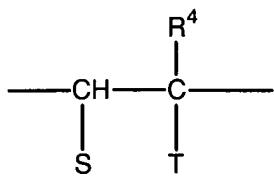
$R^3 = H$  or an aliphatic hydrocarbon radical,

$p = 0$  to 3,

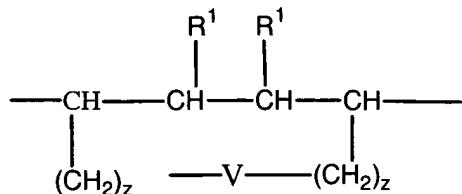
$q = 0$  to 6,

$t = 0$  to 3, and

c) about 0.1 to about 10 mol% structural groups of the formula IIIa or IIIb



IIIa



IIIb

where

$R^4 = \text{H or } CH_3;$

$S = \text{H, } -COOM_a \text{, or } -COOR^5;$

where

$R^5 = \text{aliphatic hydrocarbon radical, cycloaliphatic hydrocarbon radical, or aryl radical;}$

$T = \underline{-COOR^5, \text{in the case where } 5 \text{ is } -COOR^5 \text{ or } COOM_a, -U^1-O-(C_mH_{l+m}O)_n-(C_mH_{l+m}O)_oR^6}$

$\underline{-U^1-(C_mH_{l+m}O)_n-(C_mH_{l+m}O)_o-R^6};$

where

$l = 1 \text{ or } 2,$

$m = 2$  to  $18$ ,

$n = 0$  to  $100$ , and

$o = 0$  to  $100$ ;

$U^1 = -CO - NH-, -O-,$  or  $-CH_2O-,$

$R^6 = R^1;$

$-CH_2 - CH - U^2 - C = CH$

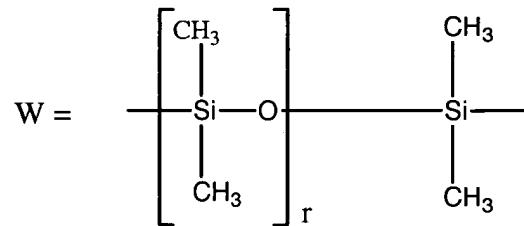
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$R^4$              $R^4$     S

where

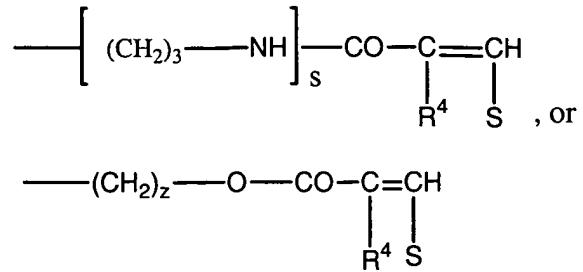
$U^2 = -NH - CO-, -O-, OCH_2,$  or  $-W-R^7,$

where



$r = 2$  to  $100$ , and

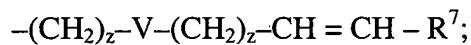
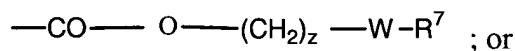
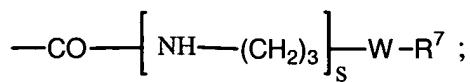
$R^7 = R^1,$



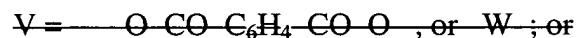
where

$$s = 1 \text{ or } 2$$

$$z = 0 \text{ to } 4;$$



where, in the last three radicals,



~~---COOR<sup>5</sup>, in the case where S is ---COOR<sup>5</sup> or COOM<sub>a</sub>;~~

wherein the polymerization occurs in aqueous solution at a temperature of from about 20 to about 100°C in the presence of a free-radical initiator

-- water;

-- optionally a co-solvent;

and

-- optionally an auxiliary.